CONANT BROOK DAM

MONSON, MASSACHUSETTS

FOREST MANAGEMENT PLAN

MASTER PLAN APPENDIX B

AND

FISH AND WILDLIFE MANAGEMENT PLAN

MASTER PLAN APPENDIX D

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
OPERATIONS DIVISION, WALTHAM, MASSACHUSETTS

May 1981

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* Conant Brook Dam, Monson, MA. Forest Management Plan App. B Fish and Wildlife Management Plan App. D		5. TYPE OF REPORT & PERIOD COVERED: Management Plan 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): U.S. Army Corps of Engineers, New England Division		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS: Dept. of the Army, Corps of Engineers, New England Division, NEDOD, 424 Trapelo Rd., Waltham, MA 02254		12. REPORT DATE: May 1981 13. NUMBER OF PAGES: 23 (+ 2 DF's)
14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*		15. SECURITY CLASS. *(of this report)*: Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT *(of this Report)*: Approved for Public Release: Distribution Unlimited		
17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*: lands and waters, fish and wildlife, managing resources, natural resources forests		
20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*		

The objectives of this management plan are to outline management practices which are compatible with flood control operations, multiple-use practices of project lands and waters, and the ecology of the project area.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
NEDOD-P	Master Plans, Appendices B & D, Forests and Fish and Wildlife Management Plan, Conant Brook

TO: See Distribution

FROM: Chief, Operations Division

DATE: 14 August 1981

CMT 1: Mr. Mitchell/bp/305

1. The subject appendices, prepared in accordance with ER 1130-2-400, dated May 1971, has been approved by the Division Engineer.

2. The plan has been developed to increase the value of reservoir lands for recreation and wildlife, and to promote natural ecological conditions by following accepted conservation practices.

3. This plan has been developed in coordination with the U.S. Fish and Wildlife Service, and the Massachusetts Divisions of Forests and Parks; and Fisheries and Wildlife.

ANDRE LIUNAS

Incl
as

Distribution:

(2) CDR USACE (DAEN-CWO-N)
WASH D C 20314
(15) Operations Division, NED
(1) Planning Division, NED
(1) Engineering Division, NED
(1) Real Estate Division, NED
(5) Basin Manager, TRB
(5) Project Manager, East Brimfield Lake
(5) Massachusetts Executive Office of Environmental Affairs

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
NEDOD-P	Master Plan Appendices B and D, Forest and Fish and Wildlife Management Plan, Conant Brook

TO	FROM	DATE	CMT 1
Commander	Chief, Operations Division	5 August 1981 Mr. Mitchell/bp/305	

1. Inclosed for your approval is the Forest and Fish and Wildlife Management Plan for Conant Brook. This plan will serve as Appendices B and D to the Master Plan for this project.

2. It has been prepared in conjunction with ER 1130-2-400, dated 28 May 1971. It has been reviewed by NED Planning, Engineering and Real Estate Divisions; and the Massachusetts Department of Environmental Management, the University of Massachusetts and the Cooperative Extension Service. Appropriate changes have been incorporated.

3. Division Engineers have been designated as approval authority for these plans by ER 1130-2-400. Information copies are to be forwarded to OCE upon approval.

ANDRELIUNAS

Incl
as

CF: Oper Div File

TO: Chief, Operations Division | FROM: Commander | DATE: | CMT 2

APPROVED ☒ DISAPPROVED ☐

C.E. EDGAR, III
Colonel, Corps of Engineers
Commanding

DA FORM AUG 80 2496 PREVIOUS EDITIONS WILL BE USED

CONANT BROOK DAM

MONSON, MASSACHUSETTS

FOREST MANAGEMENT PLAN

MASTER PLAN APPENDIX B

AND

FISH AND WILDLIFE MANAGEMENT PLAN

MASTER PLAN APPENDIX D

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
OPERATIONS DIVISION, WALTHAM, MASSACHUSETTS

May 1981

ACKNOWLEDGEMENTS

The Corps of Engineers, New England Division, wishes to thank the following people for their effort in developing this natural resource management plan:

Mr. John Clarkin - Park Manager TRB

Ms. Joan Cyr - Park Ranger TRB

Mr. Charles Freeman - Planning Division

Mr. David Buelow - Engineering Division

Mr. Russel Keeler - Real Estate Division

Mr. John Mitchell - Operations Division

Ms. Louraine Bogosian - Work Processing

Reprographics Section - Graphics and Reproduction

Also, thanks to the U.S. Fish and Wildlife Service and the Massachusetts Division of Fisheries and Wildlife for their review comments of this plan.

CONANT BROOK DAM
MONSON, MASSACHUSETTS

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

SECTION 1. INTRODUCTION

Purpose

The lands, forests, and waters of Conant Brook are valuable assets to the surrounding areas providing diverse recreational opportunities and preserving natural areas in public ownership as well as protecting the lakes and streams within the flood control project. The intelligent management of the lands and waters according to sound ecological practices will insure their existence and continued productivity for future generations.

The purpose of the forest management portion of this plan is to describe the forest resources contained within the project boundaries, and to provide a framework for managing these resources. The fish and wildlife portion of this plan describes the fish and wildlife resources of the project and serves as a guide to their management. The plan will enhance the value of the natural resources in the project area for recreation, aesthetics, and provision of forest products for future generations.

Authority

This plan constitutes of Appendix B (Forest Management Plan) and Appendix D (Fish and Wildlife Management Plan) to the project master plan authorized under ER-1130-2-400 dated 28 May 1971.

Management Objectives

The objectives of this management plan are to outline management practices which are compatible with flood control operations, multiple-use practices of project lands and waters, and the ecology of the project area. Specific objectives are to protect and enhance the natural beauty and character of the area; to provide for diversified recreational use of project natural resources including hunting and fishing, nature observation and interpretation; sports, athletics, and general physical fitness; to maintain and enhance conditions desirable for fish and wildlife habitat; to maintain a thrifty, vigorous forest; and to, where compatible and practical, provide wood products for project use, national defense, and commercial purposes.

Coordination

Development of this management plan has been coordinated with the Massachusetts Department of Environmental Management (Division of Fisheries and Wildlife and Division of Forests and Parks); the University of Massachusetts, Amherst, Department of Forestry; Cooperative Extension Service, Amherst; the U.S. Soil Conservation Service, Hadley, Massachusetts; and the Board of Selectmen, town of Monson, Massachusetts.

SECTION 2. PROJECT DESCRIPTION

Location

Conant Brook Dam is located on the Conant Brook in the southeast section of the town of Monson, county of Hampden. Access to the area is by Mass. Rt. 20 to Rt. 32 south, or, from Conn. by I-89 to Rt. 32 north.

Acquisition

Conant Brook Dam was authorized by the Flood Control Act of 1960 (House Document 434, 86th Congress, Second Session). This Act also authorized local flood protection projects at Chicopee Falls and Three Rivers. All of these projects are in the Chicopee River Watershed, the largest tributary watershed in the Connecticut River Basin.

The project consists of approximately 438 acres (1978 survey) owned in fee and two acres held in flowage easement.

Construction of Conant Brook Dam and appurtenant facilities was initiated in 1964 and completed in September 1966 at a cost of $2,947,000.

General

The majority of the 438 acres of fee land is wooded. Approximately three acres are used for project operations with three acres for a small permanent pool. There are two agricultural leased areas which are used for grazing and growing hay which total 85.5 acres. The remaining non-forested areas are made up of grass areas, old borrow pits and old spoil areas.

Spillway crest is at 757 NGVD and has a gross storage capacity of 3,740 acre-feet, equivalent to 9.0 inches of runoff from an area of 7.8 square miles.

The town of Monson uses a small reservoir just below the dam as their secondary water supply. This restricts the use of the area for swimming and camping and other uses which may lower the water quality.

Finally, Tenneco Gas Co. has a pipeline easement which crosses through the project.

History

Due to the rolling landscape and several large wet areas, agriculture was never an important industry within the project boundaries. However, the Corps does lease two areas for agricultural purposes to local farmers.

At one time there were several small gravel pits but these are slowly returning to forested land through natural seeding.

The area within the boundary was at one time the main water supply for Monson. However, upon acquisition by the Corps, the wells were dismantled and a new water supply area was found by the town. Conant Brook is an emergency water supply source but has never been used to date. The town is looking at alternative areas for an emergency water supply so that water-related recreational facilities may be constructed at the project some time in the future.

Topography

The project is located within the western part of the Worcester plateau, a region of moderate relief. The project itself is generally hilly with elevations varying from about 700 NGVD at the dam site to a maximum of approximately 900 NGVD. The slopes of the hills have either an east or west aspect.

Conant Brook drains an area of approximately 7.8 sq. miles. The poorly drained narrow valleys and the slope of the hills are conducive to rapid runoff. This results in quick inundation of the lower levels of the project during heavy rain or snowmelt.

Climate

Conant Brook is a small stream flowing into Chicopee Brook, a tributary of the Quaboag River. The latter flows into the Chicopee River which is an important tributary of the Connecticut River.

The Chicopee River Basin has a modified continental climate and is generally warm to hot in the summer and moderately cold in the winter.

The Chicopee River Basin is subject to 4 general types of storms which may be classes as extratropical continental, extratropical marine, storms of tropical origin (some of which attain hurricane magnitude), and continental thunderstorms. The rapidly moving continental or cyclonic storms that cross the basin from the west or southwest produce frequent periods of rainfall but are not extremely severe. The continental storms are apt to be more critical when they are of the stationary frontal type and produce appreciable rainfall over a given area on several successive days. Thunderstorms can produce critical rainfall and may be of the frontal type or local storm type.

Of the coastal storms, tropical hurricanes are an infrequent but major source of flood-producing precipitation, particularly from August through October. The storms of August, 1955 and September, 1938 were of this type and were the two most severe of record in the basin.

Average monthly temperatures in the Chicopee River Basin vary widely throughout the year with a mean annual temperature of approximately 50°F. Freezing temperatures are generally experienced from the latter part of September to the early part of May.

The mean annual precipitation of the Chicopee River Basin is about 44 inches, ranging from less than 40 inches in the Chicopee area to more than 50 inches at the headwaters of the Ware River. On the average, the precipitation is uniformly distributed throughout the year, but considerable variation exists between the minimum and maximum precipitation occurring in the individual months.

The average annual snowfall in the Chicopee River Basin is about 50 inches, with considerably greater depths at the higher elevations. The water equivalent of snow cover generally reaches a maximum depth in March, generally about 3 to 4 inches. During the period of record, snowmelt has been insufficient alone to produce a major flood. Nevertheless, a serious flood due to heavy rainfall combined with snowmelt runoff is a possibility in spring.

Geology and Soils

During the waning stages of the glacial period, the Worcester plateau was altered by intermittent cycles of erosion and deposition from an irregularly oscillating ice margin. This action left glacial till, boulders, kettles and other features after the glacial retreat.

Bedrock in the project consists of altered granitferous mica schist with stringers and veins of quartz and feldspar. This bedrock generally runs in a north-south direction leaving two valleys between the hills. The first is Vinica Brook which enters the project from the southeast, and the second is a smaller brook which originates in the swamp just below the dike in the northern part of the project.

The soils in these valleys consist primarily of glacial and glaciofluvial materials which are poorly drained. This has resulted in the extensive swamp below the dike.

The general soil classification for the rest of Conant Brook Dam is the Hinckley-Windsor-Merrimac Association. These soils are characterized by being droughty and well-drained, sandy and gravelly soils. This soil association generally occurs on gently sloping to moderately steep terrain.

Hinckley soils are droughty loamy sands that are underlain by stratified sand and gravel at depths of less than 18 inches. Windsor soils are droughty loamy sands that are formed in thick deposits of sand. Merrimac soils are well-drained fine sandy loams and sandy loams. They are underlain by stratified sand and gravel deposits at depths of 24 to 30 inches.

These soils and their associates tend to favor the growth of central hardwood species over the northern hardwood species, which require well-drained but moist soils.

The swamp areas and the steep hills along Vinica Brook are the only areas within the project which are conducive to active wildlife management. Other areas can support forest management and logging activities.

Erosion is not a problem at Conant Brook Dam except in areas which are being used by ORV's. These areas are the gas pipeline, the borrow pit south of the dam, and the spoils area north of the dam. Reforestation and designating restricted access should help to alleviate this problem.

A detailed soil cover map by the Soil Conservation Service is on file at the Thames River Basin Headquarters at Buffumville.

SECTION 3. PHYSICAL AND ECOLOGICAL CHARACTERISTICS

Forest Lands

Conant Brook Dam lies in a transitional area between the northern hardwoods (birch, beech, maple) and the central hardwoods (oak, hickory, chestnut). However, because of generally droughty soils, the central hardwoods are by far more numerous and important.

The project area was at one time used as a water supply watershed for Monson and the land was left forested, thus there are large amounts of merchantable lumber, especially red and white oak (Quercus spp.), hemlock (Tsuga canadensis), white pine (Pinus strobus), and red maple (Acer rubrum). Plantations of white pine, red pine (Pinus resinosa), Norway spruce (Picea abies), white spruce (Picea glauca), and red spruce (Picea rubens) were also planted within the watershed.

Forest Compartments

A boundary survey of the area during 1978 showed that the area consisted of approximately 438 acres. The majority of this area, 335 acres is currently forested or capable of being forested including such areas as the borrow pits and spoil areas. The remaining areas are agricultural land, open areas which should be left for wildlife areas, a gas line right-of-way, a few small ponds, and the dam structures. See Exhibit B, Map 1.

Forest Types

In general the project lands contain both natural and artificial features including Duck Pond (a bog of significant interest) several swamps, intermittent streams, an old reservoir and numerous wood roads that are used for management and access. Cover types contain both red and white pine (Pinus spp.) plantations, several areas of northern hardwoods and greater amounts of central hardwoods. A listing of tree species at Conant Brook can be found in Table 3. A forest compartment map may be found in Exhibit B. Included in the inventory process is a stand description with height classes and crown closure.

Central hardwoods occupy 140 acres and consists of northern red oak, basswood and white ash. Common associates in New England are red maple, yellow birch, aspens, sugar maple, paper birch and beech. Considered as a transitional hardwood, sugar maple, yellow birch and beech become the climax forest type. These trees occur on the more fertile, moist sites of the project. Mast and browse production are easily controlled in these species.

The second most common forest cover type at Conant Brook is Type 20, White Pine, Northern Red Oak and White Ash. The chief associate is red maple. This type occurs on the dryer sites with white pine generally

becoming the climax species. Total area covered by this type is 86 acres. Saw timber production is usually high with soil erosion and adverse impacts from logging kept to a minimum due to dry soil conditions.

The third largest area consists of red and white pine plantations. The 41 acres in this group contain very high basal area volumes for both species. Reproduction in these stands is nonexistant except in areas where blow down has occurred.

The remaining 57 forested acres contain various mixtures of white pine, hemlock, and northern red oak. This forest type has high potential timber productivity and is of high wildlife habitat value. Management in these areas should stress maintaining the mixed natural occurence of these types.

Forest Inventory

A detailed timber inventory cruise in 1980 delineated the lands of Conant Brook into six forest management compartments utilizing the S.A.F. forest classification system. Non-forested and project operations areas made up the remaining areas. Table 1 contains a listing of land areas and approximate acreages. Timber volumes were determined at the 90% confidence level utilizing a 10 BAF prism in a non-stratified, variable radius, random inventory process. Forested areas consist of 324 acres with six forest types. Project Operations uses 14.8 acres, open water 12.6 acres and remaining wetlands and/or fields 77 acres. Table 2 contains the basal area and board foot volumes for each forest type. In general the forest lands support approximately 6,000 board feet per acre of well stocked timber. Understory reproduction ranges from slight to moderate with moderate cover and available browse for wildlife.

Open Land

Open lands are found at the dam site and on the appurtenant structures. These will be left free from cover for operation reasons. Two areas for agricultural leases are open and will remain so. A small open area along the brook flowing from Squire Pond is open but is slowly being overgrown. Other open areas are a small borrow pit area, the grassland around the swamp below the dike, and the two areas just north and south of the dam. These last two areas have some pioneer species growing on them and will be maintained at the pioneer stage of succession to encourage ecotone maintenance for habitat variation. The present areas will be kept open by mowing or prescribed burning.

Recreation Areas

At the present time there are no developed recreation areas. The town of Monson does have several recreation areas in mind but nothing has been developed to date.

Conant Brook is used for ORV's, snowmobiling, fishing, hunting and other activities. All forestry practices conducted in the area will bear this in mind.

Aesthetic Areas

There are no developed aesthetic areas but there is one area which affords a pleasant view. This is at the top of the old borrow pit overlooking the dam from the south. Besides vistas, there are several areas which afford the user peace and tranquility in a sylvan surrounding. These include Squire Pond, numerous trails through the woods and small streams.

Fish and Wildlife Management Areas

The Commonwealth of Massachusetts stocks pheasant within the boundaries and trout just below the dam. However, both stockings are on a put and take basis.

Wildlife areas will be set aside where little or no management practices will occur. Those areas are the large swamp in the north, the woods around Duck Pond and Squire Pond and any open areas. The borrow and spoils areas should be planted with wildlife cover and pioneer species trees planted to grow in the poor cover soils. This will be carried out in conjunction with the Massachusetts Division of Fisheries and Wildlife.

Future TSI or logging activity will be conducted, whenever possible, in such a way as to be an aid in helping wildlife by providing cover and food.

The streams and ponds all support fish, which include native brook trout, bass, pickerel and panfish. Logging or TSI will be done in such a way that it will not affect the quality of water in the streams and ponds, and erosion and surface runoff will be kept to a minimum.

SECTION 4. FOREST MANAGEMENT

Factors Influencing Forest Management

Several ecological factors influence the management of the forest resources at Conant Brook. These factors need to be considered and evaluated in developing viable programs for forest management that will minimize adverse effects and optimize the multiple use benefits attainable from the project.

Tree Diseases

At present very few natural diseases are present in the forest stands. It should be noted that the incidence of root rot (Fomes annosus) in red pine is on the rise in Massachusetts western forests and could pose a threat to eastern forests. Any tree removal in the red pine plantation should have a borax treatment on the freshly cut stumps to prevent fungal entrance and disease transmittance. Severe infestations could warrant complete removal of all red pine stems in the plantation areas.

White pine blister rust (Cronartium ribicola) can reach epiphytotic levels but at present little if any infestation can be observed. Blister rust can be controlled by eradicating the alternate host Ribes spp. within 1,000 feet of any white pine stand.

Insects

The single greatest threat to the forests of Conant Brook is the presently heavy infestation of the Gypsy Moth (Lymantria dispar). Larvae hatches have been severe in the spring of 1979 defoliating large areas of hardwoods throughout New England. Tree mortality can occur through successive attacks by weakening and degeneration. Project personnel should be alert to extensive hardwood mortality in order to salvage any material. Conversion to softwood stands may be an alternative to total forest decline.

Soil Erosion

Due to natural and unnatural causes, several areas within the project require soil stabilization to keep the soils from washing into surrounding streams and ponds. Erosion control will occur in the following four areas.

Gas Line: (A) The gas line right-of-way is constantly used by many types of ORV's. This has caused a serious erosion problem on the slopes. In order to correct this (a) barriers will be placed and maintained in order to eliminate access, (b) revegetation of the slopes with a grass cover and/or plantings of sweet fern (Comptonia peregrina) for stabilization.

Stream Banks: Down stream of the dam on the west side is a slump area. This will be stabilized using a structural toe and back filling the area and establishing vegetative cover.

Roads: Existing roads will be maintained. Erosion on some areas has rendered the road almost impassable.

Borrow Area: These areas will be planted to species that will grow best and be of most benefit to wildlife.

Flood storage operations have not contributed to soil erosion at the project.

Decisions on forest management activities will be guided by considering erosion potential. The project has an extensive system of gravel roads negating any new construction. Skid roads and log yards will be positioned in areas having suitable soil stability.

Short Range Forest Management Program

Programs to be implemented are in the following paragraphs.

Planting

The eroded slope across from the white/red pine plantation has been closed off with boulders. In order to stabilize the bank, aspen twig bundles will be planted along the contour. It is anticipated that sprouting will help hold the bank while the buds provide favorite food for grouse. The use of sweet fern can also aid in control.

Timber Stand Improvement

The red and white pine plantations at Conant Brook have not been treated in the past resulting in a high basal area per acre of 200+ sq. ft.; low live crown ratio of 20%; and a low growth rate. A two stage thinning is necessary to slowly release the better crop trees and to prevent the chances of windthrow. The first thinning will reduce the basal area to approximately 130-150 sq. ft. with the second reduction to 90-100 sq. ft. The material to be removed can be girdled and left standing or sold for poles, posts or timbers if market conditions permit.

The mature pine stands 21-4-B will have 60% of the basal area removed. A summer operation would provide the necessary scarification to promote white pine seeding. The final shelterwood cut would occur approximately 10 years later once the reproduction is established.

Long Range Management Program

Forested areas will be managed to produce good quality trees of desirable species. Timber harvests will stimulate regeneration of not only trees but also herbaceous plants of value for wildlife food and cover.

With proper management the entire forest could be sustained on a long term basis and yield not only cordwood and sawlogs but also improve wildlife habitat while protecting the aesthetic and watershed values of the land at Conant Brook.

Any timber removal will be coordinated with project personnel and project operations foresters. At no time will the aesthetic and ecological quality of the project be placed in jeopardy.

Aesthetics

The natural beauty of the Conant Brook area are very important and must be protected. All silvicultural operations will be performed to improve or at least impart no long term adverse influence on the aesthetics of the area. Clearcutting will not be a favored practice in timber removal. Buffer zones and cautious tree removal practices will be employed to assure proper vegetative cover.

Monitoring of Forest Conditions

The general conditions and trends of the forests at the dam must be monitored periodically to assess the effectiveness of silvicultural operations and the need for further treatments. The forests should be checked regularly for signs of developing disease and insect problems so that corrective actions can be undertaken if necessary.

Management Direction

All timber stand improvement and other silvicultural operations will be implemented under the direction of the TRB Park Ranger/Forester in conjunction with a qualified professional forester. Although the project boundaries have been delineated with monuments, blazes and/or paint should be used to clearly mark the limits of Federal land between monuments in areas where cutting under the fuelwood permit program or under contract is to be done. The Thames River Basin forester/ranger will specify stand prescriptions and mark trees to be cut prior to undertaking cultural work.

SECTION 5. AQUATIC MANAGEMENT

Conant Brook operates as a self-regulating dam where outflows equal inflows up to 225 cfs whereby waters are automatically impounded. The selected conduit size permits passage of normal flows of the river without utilizing any appreciable storage in the reservoir. A shallow pool approximately three acres in size does exist behind the dam. It is considered unlikely that fish species exist due to extreme warm waters and periodic drying of the pond. This area does serve as a habitat for amphibians and reptiles. A proposal by the Mass. Division of Fisheries and Wildlife to raise the pool to 720 feet creating a pool 27 feet in depth was not approved by the Reservoir Control Center. This proposal would result in a 17 percent loss in flood storage capacity and is not acceptable. A more shallow, permanent pool at 700 feet is permissable and would cover approximately 10 acres to a depth of four feet. This depth is considered by the Mass. Division of Fisheries and Wildlife too shallow for fisheries management. Some wildlife benefits might be actualized from stop overs of migratory species, but the shallow impoundment would create potential water quality problems due to decreased flushing and increased eutrophic conditions. Because the town of Monson maintains this area as an emergency source of drinking water, no primary or secondary water contact, recreation or water quality degradation is desired. Pool depth alteration to the 700 foot level does not appear to be a viable management tool for improved fisheries management nor an appropriate methodology in sustaining downstream native trout populations.

Water Quality

The waters of Conant Brook and its tributaries are rated Class A by the Massachusetts Division of Water Pollution Control. Class A waters are uniformly excellent in character and are designated for use as sources of public water supply. Water quality requirements for Class A waters include: dissolved oxygen (DO) levels not less than 5 mg/l at anytime; total coliform bacteria not to exceed an average value of 50 per 100 ml during any monthly sampling period; no chemical constituents in concentrations that would be harmful or offensive to humans or harmful to animal of aquatic life; and no color, taste, odor or pH other than that arising from natural conditions. At present the waters of Conant Brook are of generally high quality with dissolved oxygen saturation levels usually above 80 percent. The pH is frequently below 7.0 with a mean value of approximately 1.4 and a measured minimum value of 4.4. The law pH levels are probably due to naturally occurring phenomena. Periodic water quality sampling is conducted by the NED Materials and Water Quality Laboratory.

Aquatic Weeds

At present, no aquatic weed (macrophyte) problems exist at Conant Brook. Many macrophytes produce large standing crops and are intricately involved in aquatic food webs. A high species diversity gives stability to aquatic ecosystems by providing a wide range of habitat and food

organisms. Plant management to control troublesome conditions should include chemical, biological and mechanical techniques that will provide for the most suitable and stable conditions.

Short and Long Range Management

Consideration should be given to maintaining the present water quality. Raising the pool to 700 feet will not be implemented unless there is clear evidence that this action will serve a higher recreational or project operations need.

Endangered Species

No endangered aquatic species are known to exist at Conant Brook.

SECTION 6. WILDLIFE MANAGEMENT

The lands in and around Conant Brook have a rustic, untouched quality. Other than the occassional passerby, there has been very little disturbances in the woods by man. This lack of man's intrusion has resulted in an interesting and unusual array of flora and fauna.

Among the more usual upland game forest inhabitants are the woodcock (Philohela minor), ruffed grouse (Bonasa umbellus), cottontail rabbit (Sylvilagus floridanus) and grey squirrel (Sciurus carolinensis). Whitetail deer (Odocoileus virginianus) are present in the project and use a run or trail that borders one side of Duck Pond. The run exhibits intensive use and wanders through a mixture of forest types including areas of good browse, cover, wild berries and acorns. Management efforts will be directed toward maintaining the present conditions and not developing or altering the area.

Stocking of pheasants (Phasianus colchicus torquatus) is conducted by the Massachusetts Division of Fisheries and Wildlife under verbal agreement with the Project Manager. Stocking occurs prior to the hunting season and is the only form of active terrestrial game management on the project. Because "put and take" pheasant management is a major concern, little wildlife management is aimed at other species. Parameters necessary for proper management, including wildlife population estimates, species composition and trends are largely unknown for the land at Conant Brook. The completion of a comprehensive game and non-game census for the entire western Massachusetts region is anticipated by the Massachusetts Division of Fisheries and Wildlife in the early 1980's. The results of this research effort will be useful in guiding management efforts.

Forest Management Effects on Wildlife

Active forest management at Conant Brook will be directed toward maintaining or improving the wildlife habitat. A variety of forest types presently exist that are satisfactory habitat for wildlife species. Silvicultural operations including timber harvesting, regeneration and improvement thinnings will be applied to enhance the development of an understory in areas of intense crown competition. Crop tree release will allow young, mast bearing trees to grow and develop more mast and remain healthy. Patch cutting is not a preferred management technique due to the small size of the project (469 acres) and large diversity of naturally occurring ecotones. The barren section of the borrow area and the eroded hillside will be planted to aspen using the wattling technique of laying bundles of aspen stems in shallow trenches along the contour. The bundles will check water flow as well as sprout new foliage that will develop into new trees. The shrub sweet fern (Comptonia peregrina) will also be planted utilizing short pieces of plant stem that occur naturally and placed in the soil in early spring. Aspen is a preferred food of grouse while sweet fern provides some cover for birds and smaller mammals.

The large field on the entrance road will be maintained in early successional stages by mowing and clearing the entire area. One third of the area will be strip mowed. This mowing will be done in strips approximately twenty feet wide. Field control provides for both higher biomass production and trophic levels to occur closer to the earth.

Waterfowl

The "frost-pocket," or glacial depression, that forms Duck Pond is a natural wetland habitat and is suitable for the installation and maintenance of wood duck (Aix sponsa) boxes. The Massachusetts Division of Fisheries and Wildlife has maintained wood duck boxes in the past but is not actively involved in this management activity at present. The installation and yearly inspection of boxes will be rejuvenated with two boxes set out in the spring of 1982. The lands in and around Duck Pond will be set aside as a natural area for the preservation of this unique habitat. An informative sign will be posted to educate users of the area about the natural ecological sucession of plants and the relationship between wildlife management and plant succession. No boxes will be installed in the impoundment area due to potential losses from flooding.

Observation

Visitors to Conant Brook are afforded several means of wildlife observation. The first method would be by walking the numerous roads that wander through the project and enjoying what-ever birds or mammals happen by. A second method would be to enter the woods, particularly around Duck Pond, and sit quietly at one of the observation stations and enjoy the solitude. Observation stations will be created at Duck Pond by the removal of vegetation that blocks one's view down on the water surface. At no time will the creation or maintenance of these vistas interfere with the natural beauty of the area.

SECTION 7. RARE, THREATENED AND ENDANGERED SPECIES

The waters of Duck Pond, in Conant Brook Reservoir, support a population of Golden Club (Orontium aquaticum). This aquatic plant is considered rare in the State of Massachusetts as determined by the Massachusetts Natural Heritage Program. Of the approximate seven populations in the State, Conant Brook affords the best conditions for the most vigorous colony growth. Protective management of the area would include two major considerations: maintenance of the pond's normal water level and maintaining the pond's nutrient balance. As mentioned previously, Duck Pond is a glacial depression with no surface inflow or outflow of water. Natural seepage, runoff and evaporation are the only means of water transfer. Therefore, other than seasonal fluctuation, the pond will remain at its present natural level.

The nutrient levels of the pond are also self regulating with normal detritus accumulations occurring associated with leaf litter and vegetative decay. Through time Duck Pond will slowly fill in and evolve through swamp to bog to moist peat and muck accumulations that will eventually support forest trees. Thousands of years are necessary for this process thus the Golden Club will remain in its present niche in the life of the pond for many years.

The slopes around the pond and the waters held within will be preserved in their present natural state as a Natural Area. Yearly inspections of the area will occur in coordination with the Massachusetts Natural Heritage Program to assure continuity of management perspectives. Photographs will be taken during these inspections to serve as an indicator of aquatic plant or water level change.

The wood duck boxes to be installed will be located in areas where no impact on Golden Club will occur.

A second feature of the forest lands of Conant Brook is the large number of Chestnut tree (Castanea dentata) sprouts. This specie of tree was once the major component of eastern hardwood forests until the fungus (Endothia parasitica) was introduced to the United States in 1904. Stump sprouts grow to a maximum of four inches in diameter or approximately 25 feet in height before succumbing to the disease. None-the-less, resistant individuals do exist throughout the northeast and the large number of Chestnut sprouts at Conant Brook might produce a resistant individual.

Finally, the bog area in the northern end of the project supports several large colonies of Pitcher plants (Sarracenia purpurea). Though not threatened or rare, the pitcher plant is unusual and inhabits only sphagnum bogs and is a representative member of a unique habitat type.

SECTION 8. INFORMATION-EDUCATION

General

Information and education are important aspects of the natural resource management program. It is imperative that the public be informed of management decisions and programs. Efforts will be made to publicize programs and actions, particularly natural area designations.

Educational efforts will be directed at explaining the purposes behind management and broadening the general public's understanding of ecological relationships.

The image and understanding of the Corps recreation-resource management program can only be enhanced by public contacts initiated through an organized public relations program.

Current information and education efforts concerning forests, fish and wildlife at Conant Brook will be expanded to include attractive brochures that are educational, informative and specific to the project.

Interpretive Programs

As natural resource management progresses at Conant Brook, enjoyable and informative passive recreational programs will be instituted to increase public awareness and encourage use of wildlife resources on the project. Interpretive nature trails that have been planned will be developed where feasible.

Training

Cooperation with other resources agencies in the planning and implementation stages of resource management will incorporate interagency training and professional instruction for field managers. Multidisciplinary training will receive high attention but participation in onsite resource management activities will also be stressed. Procedures and standardization of user surveys and status of current fish and game laws are among some items in which Corps rangers need training. As conditions arise, managers are urged to identify other training needs and coordinate programs applicable to their management activities.

Research Cooperation

The Corps of Engineers supports university research and studies that attempt to solve current natural resource problems. Conant Brook is open for any such activities that will benefit the education of university students, research personnel and environmental programs at the project.

SECTION 9. FIVE YEAR WORK PLAN

General

The short range management programs delineated in this plan will be implemented within the next five years. Annual work plans will be developed in detail for a five year period by project personnel, and updated annually. Work plans will be consistent with the overall objectives of the management plan, acceptable Corps of Engineers practices and available funds.

Initial Work Plans

Year 1	Control erosion in borrow area. Designate Duck Pond Natural Area.
Year 2	Wood duck box installation. Thinning in red and white pine plantation.
Year 3-5	Scenic vistas/Observation stations. Road maintenance. Boundary line marking.

Disposal Plan

When commercial thinning and timber sale operations are carried out, and forest products are determined to be surplus to project needs, a disposal plan will be prepared.

SECTION 10. PERSONNEL AND FUNDING REQUIREMENTS FOR IMPLEMENTATION OF THIS PLAN

The following personnel and funding will be needed to begin the short range programs in Year 1, initial work plan.

Control erosion in borrow area

1 GS-5/7 Park Ranger for 2 weeks	=	$1,013.00
1 GS-04 Forest Tech for 2 weeks	=	833.00
1 P/U at $25/day for 2 weeks	=	250.00
1 Chainsaw at $10/day for 2 weeks	=	100.00

Designation of Natural Area

1 GS-5/7 Park Ranger for 2 days	=	$145.00
1 Interpretive Sign	=	250.00

REFERENCES

Lancaster, Kenneth F. and William B. Leak, A Silvicultural Guide for White Pine in the Northeast, for Sev. Gen. Tech. Report NE-41, Northeastern Forest Experiment Station, Broomall, PA. 1978.

Leak William B., Dale S. Solomon and Stanley M. Filip, A Silvicultural Guide for Northern Hardwoods in the Northeast, Forest Service Research Paper NE-143, Northeastern Forest Experiment Station, Broomall, PA. 1969.

The Silviculture of Oaks and Associated Species, Forest Service Research Paper NE-144, Northeastern Forest Experiment Station, Upper Darby, PA. 1970.

Society of American Foresters, Forest Cover Types of North America, Bathesda, MD. 1954.

EXHIBIT A. TABLES

Table	Title
1	Land Classification and Forest Types (Acres)
2	Common & Scientific Names of Trees
3	Timber Volume Estimate for Individual Species and Forest Cover Type

EXHIBIT A

TABLE 1

Land Classification and Forest Types
(ACRES)

Project Operations	14.8
Borrow Area	10.1
Open Field	46.4
Open Water	12.6
Marsh/Swamp	30.6
Northern Red Oak-Basswood	
White Ash SAF 54	140.3
Northern Red Oak SAF 55	19.6
White Pine - Northern Red Oak	85.9
White Ash SAF 20	
White Pine-Hemlock SAF 22	27.1
White Pine SAF 21	10.4
White Pine/Red Pine Plantations	40.6
TOTAL	438.4

TABLE 2

Common and Scientific Names of Trees at Conant Brook

Ash, white	*Fraxinus americana*
Aspen, big tooth	*Populus grandidentata*
Aspen, trembling	*P. tremuloides*
Basswood	*Tilia americana*
Beech, American	*Fagus grandifolia*
Birch, paper	*Betula papyrifera*
Birch, grey	*B. populifolia*
Birch, yellow	*B. alleghaniensis*
Elm, American	*Ulmus americana*
Hemlock, eastern	*Tsuga canadensis*
Hickory	*Carya orata*
Maple, red	*Acer rubrum*
Maple, sugar	*A. saccharum*
Oak, northern red	*Quercus rubra*
Oak, white	*Q. alba*
Pine, eastern white	*Pinus strobus*

TABLE 3

Timber Volume Estimates for Individual Species and Forest Cover Types

Board Foot: International 1/4 Inch Rule

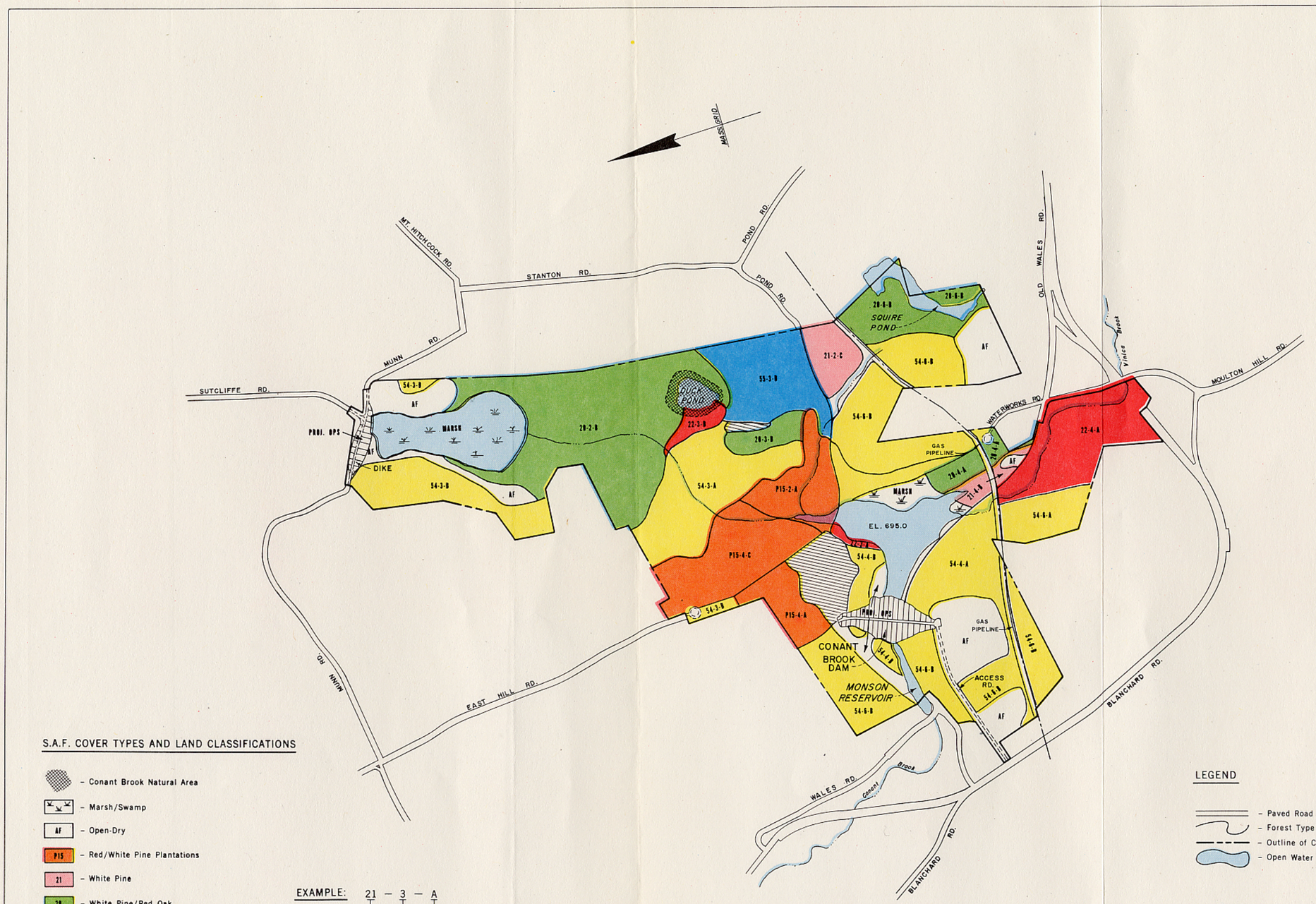
SAF TYPE	ACRES	BA/A	VOLUME/ACRE BY SPECIES* HARDWOOD		SOFTWOOD		TOTAL VOLUME BY TYPE HARDWOOD	SOFTWOOD	TOTAL
54	140.3	106	RM	871	WD	884	423,004	169,201	592,205
			RO	670	HEM	402			
			HICK	134					
			WO	1,340					
55	19.6	50	RO	670			13,132		13,132
20	85.9	98	RM	502	WP	4,773	122,235	410,000	532,235
			WO	921					
22	27.1	160	YB	670	HEM	4,020	108,942	108,942	217,884
			RO	3,350					
21	10.4	120			WP	17,085		177,684	177,684
PLANTATION	40.6	240			RP	11,565		469,539	469,539
							667,313	1,335,366	2,002,679

*

RM = Red Maple
RO = Red Oak
HICK = Hickory (Shagbark)
WO = White Oak
WP = White Pine
HEM = Hemlock
YB = Yellow Birch
RP = Red Pine

EXHIBIT B. MAPS

Map	Title
1	Forest Compartments and Cover Types
2	Wildlife Management



S.A.F. COVER TYPES AND LAND CLASSIFICATIONS

- Conant Brook Natural Area
- Marsh/Swamp
- AF – Open-Dry
- P15 – Red/White Pine Plantations
- 21 – White Pine
- 28 – White Pine/Red Oak
- 54 – Red Oak/Mixed Hardwoods
- 55 – Red Oak
- 22 – Hemlock/Pine
- Project Operations
- Pits/Spoils Areas

EXAMPLE: 21 – 3 – A

- 21 – S.A.F. Cover Type
- 3 – Height
  - 1–0'-20'
  - 2–21'-40'
  - 3–41'-60'
  - 4–61'-80'
  - 5–81'-100'
- A – Stocking (% Crown Closure)
  - A–81-100
  - B–61-80
  - C–41-60

LEGEND

- Paved Road
- Forest Type Boundary
- Outline of C.E. Property
- Open Water

FOREST COMPARTMENTS AND COVER TYPES OF CONANT BROOK DAM

400 0 400 800 1200

EXHIBIT B

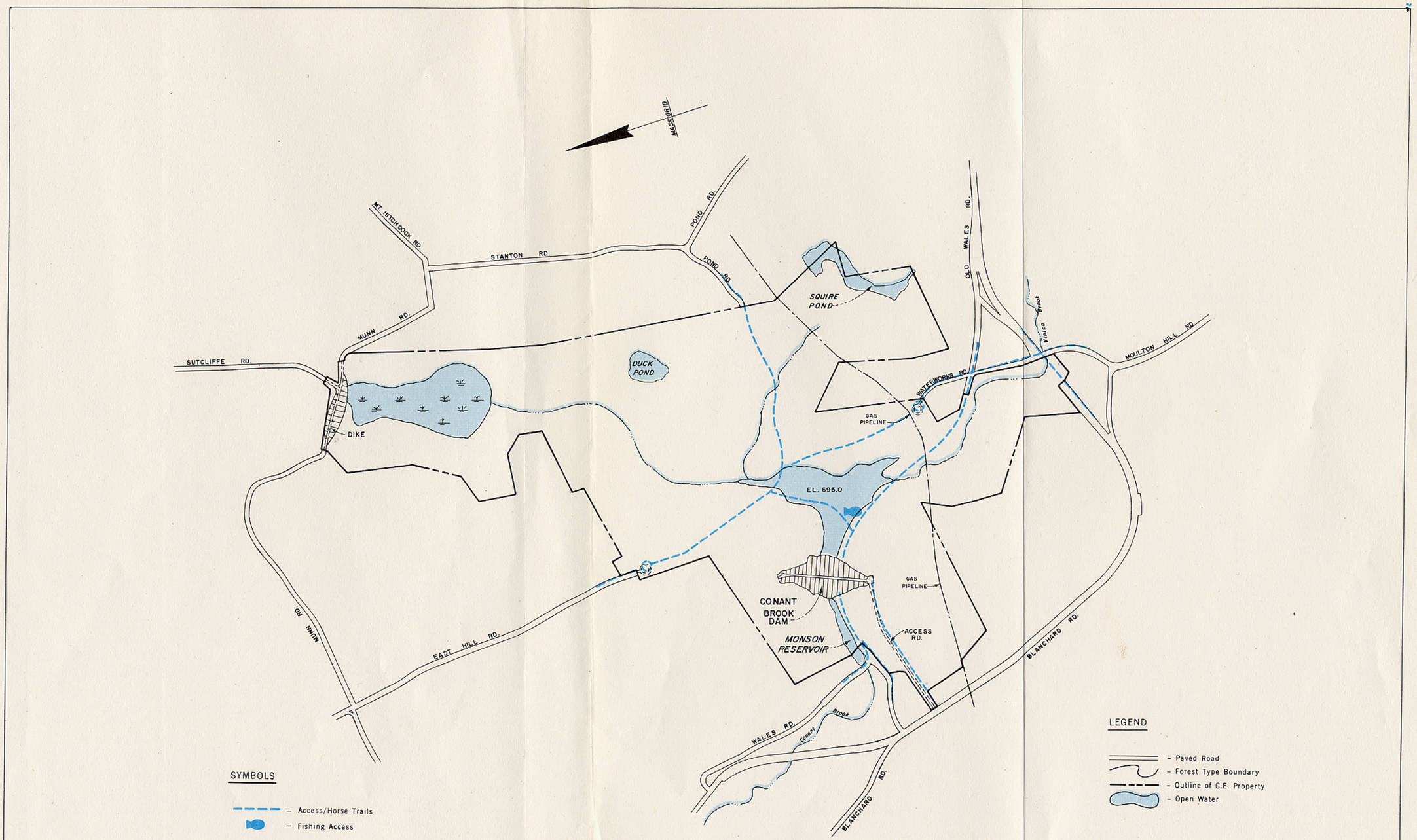

MASSBRO
MT. HITCHCOCK RD.
STANTON RD.
POND RD.
POND RD.
MUNN RD.
SUTCLIFFE RD.
DUCK POND
SQUIRE POND
OLD WALES RD.
Vinica Brook
MOULTON HILL RD.
WATERWORKS RD.
GAS PIPELINE
DIKE
EL. 695.0
GAS PIPELINE
CONANT BROOK DAM
ACCESS RD.
MONSON RESERVOIR
MUNN RD.
EAST HILL RD.
BLANCHARD RD.
WALES RD.
Conant Brook
BLANCHARD RD.
SYMBOLS
– Access/Horse Trails
– Fishing Access
LEGEND
– Paved Road
– Forest Type Boundary
– Outline of C.E. Property
– Open Water
WILDLIFE MANAGEMENT-
RECREATION AREAS
CONANT BROOK DAM
400 0 400 800 1200

EXHIBIT B